## REMARKS

In the Office Action, the Examiner allowed Claims 2-8 and 10-18 and rejected Claims 19 and 20 under 35 U.S.C. 102 as being fully anticipated by U.S. Patent 5,666,078 (Lamphier, et al.). The Examiner also noted several minor informalities in Claims 19 and 20.

Independent Claims 19 and 20 are being amended to better define the subject matters of these claims and to correct several informalities in these claims, including those noted by the Examiner. In addition, new Claims 21 and 22, which are dependent from Claims 19 and 20, respectively, are being added to describe preferred features of the invention.

More specifically, with respect to the informalities noted by the Examiner, the penultimate line of Claim 19 is being amended to change "o" to "of," and after line 4 of Claim 20, "a digital controller" is being added. In view of these changes, the Examiner is asked to reconsider and to withdraw the objections to Claims 19 and 20.

Moreover, for the reasons discussed below, Claims 19-22 also patentably distinguish over the prior art and are allowable. The Examiner is, thus, requested to reconsider and to withdraw the rejection of Claims 19 and 20 under 35 U.S.C. 102, and to allow these claims and new Claims 21 and 22.

The present invention relates to controlling the impedance of a driver of an input/output cell of an integrated circuit. A digital controller and a reference cell are provided to determine the extent to which the driver impedance should be changed, and then the controller sends a signal to the input/output cell to adjust that driver impedance.

In particular, the reference cell includes a node that has a variable voltage, and the digital controller applies a first signal to the reference cell to change the voltage of that node. The node voltage is compared to a reference voltage, and, on the basis of that comparison, the digital controller generates a second signal. This second signal has an adjustable value, and the controller adjusts that value until it reaches a stable condition. The controller then applies this second signal to the input/output cell.

In the aspect of the invention to which Claims 19-22 are directed, the above-mentioned second signal is held by the input/output cell until a predetermined event occurs, at which time this second signal is applied to the driver of the input/output cell to adjust the impedance of that driver.

This aspect of the invention is explained on pages 4 and 5 of the specification and illustrated in Figure 4. As explained there, in this embodiment of the invention, the above-discussed second signal is comprised of the PVT bits, which, more specifically, are comprised of six PVTP bits and six PVTN bits. As discussed on the bottom of page 4 of the specification, these bits are normally held in internal latches 22. With reference to Figure 4, the PVTP bits are passed to the driver pull-up when "A," which is the driver input, changes from "one" to "zero," and the PVTN bits are passed to the driver pull down when "A" changes from "zero" to "one." In this way, the driver impedance is changed only when the driver value itself changes.

Lamphier, et al. operates in a different way.

Specifically, Lamphier, et al. discloses an output driver circuit having a programmable impedance. In the Lamphier, et al. system, voltage from an external resistance device is compared with a voltage developed by an evaluate circuit, and a control logic adjusts the evaluate circuit with a count until the two voltages are basically equal. When this happens, the control logic uses this count to operate an off chip driver to produce a desired driving input.

As the Examiner noted in the Office Action, a signal 80 is applied to the driver of the input/output cell to adjust the impedance of that driver. A clock signal is used to determine when signal 80 is applied to adjust the driver impedance.

The Lamphier, et al. approach thus uses a clock signal to determine when to apply signal 80 to adjust the drive impedance. The present invention, in contrast, uses changes in the driver input data, represented in Figure 4 at "A," to determine when to change the driver impedance.

Claims 19 and 20 describe the above-discussed feature of this invention. In particular, these claims describe the feature that the second signal is applied to the driver of the input/output cell to adjust the impedance of the driver when the input signal of the driver changes, or in response to the that signal changing, in a predetermined manner.

This feature of the invention is of utility because, as discussed in the present application, it allows the digital control to operate either synchronously or asynchronously relative to the driver.

The other references of record have been reviewed, and it is believed that these other references, whether considered individually or in combination, are no more pertinent than Lamphier, et al. Specifically, these other references also do not suggest or teach the principal of adjusting the driver impedance when the input of the drive signal changes, as described in Claims 19 and 20.

Because of the above-discussed differences between Claims 19 and 20 and the prior art, and because of the advantages associated with these differences, these claims patentably distinguish over the prior art and are allowable. Claims 21 and 22 are dependent from Claims 19 and 20, respectively, and are allowable therewith. The Examiner is, accordingly, respectfully asked to reconsider and to withdraw the rejection of Claims 19 and 20 under 35 U.S.C. 102, and to allow these claims and new Claims 21 and 22.

For the reasons advanced above, the Examiner is requested to reconsider and to withdraw the objections to the informalities in Claims 19 and 20 and the rejection of these claims under 35 U.S.C. 102, and to allow Claims 19-22. If the Examiner believes that a telephone conference with Applicants' Attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully submitted,

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